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February 9, 1843.

Sir JOHN WILLIAM LUBBOCK, Bart., V.P. and Treasurer,
in the Chair.

The following papers were read, viz.—

1. "Magnetical Term-Observations made at the Observatory at Prague, for September, October, November and December, 1842 :"
by Professor Kreil. Communicated by S. Hunter Christie, Esq.,
Sec. R.S.

2. "On the Structure and Mode of Action of the Iris :"
by C. R. Hall, Esq. Communicated by P. M. Roget, M.D., Sec. R.S.

After reciting the various discordant opinions entertained at different periods by anatomists and physiologists, relative to the structure and actions of the iris, the author proceeds to give an account of his microscopical examination of the texture of this part of the eye, in different animals. He considers the radiated plicæ, which are seen on the uvea in Mammalia, as not being muscular; but he agrees with Dr. Jacob in regarding them as being analogous in structure to the ciliary processes. The white lines and elevations apparent on the anterior surface of the human iris, he supposes to be formed by the ciliary nerves which interlace with one another in the form of a plexus. The iris, he states, is composed of two portions; the first, consisting of a highly vascular tissue, connected by vessels with the choroid, ciliary processes, sclerotica and cornea, and abundantly supplied with nerves, which, in the human iris, appear, in a front view, as thread-like striæ; and which are invested, on both surfaces, by the membrane of the aqueous humour. They are more or less thickly covered with pigment, which, by its varying colour, imparts to the iris on the anterior surface its characteristic hue; and, by its darkness on the posterior surface, renders an otherwise semi-transparent structure perfectly opaque. The second component portion of the iris consists of a layer of concentric muscular fibres, which fibres, in Man and Mammalia generally, are situated on the posterior surface of the pupillary portion of the iris; but which in Birds extend much nearer to the ciliary margin, and consequently form a much broader layer. In Fishes and in some Reptiles they do not exist at all.

The author then proceeds to inquire into the bearings which these conclusions may have on the physiology of the iris. He thinks that the phenomena of its motions can receive no satisfactory explanation on the hypothesis of erectility alone, or on that of the antagonism of two sets of muscular fibres; the one for dilating, the other for contracting the pupil. He is convinced that the contraction of the pupil is the effect of muscular action; but does not consider the knowledge we at present possess is sufficient to enable us to determine the nature of the agent by which its dilatation is effected. He, however, throws it out as a conjecture, that this latter action may be the result of an unusual degree of vital contractility, residing

either in the cellular tissue, or in the minute blood-vessels of the iris. It is from elasticity, he believes, that the iris derives its power of accommodation to changes of size, and its tendency to return to its natural state from extremes, either of dilatation or of contraction; but beyond this, elasticity is not concerned in its movements.

February 16, 1843.

GEORGE RENNIE, Esq., V.P., in the Chair.

The following papers were read, viz.—

1. “Tide-Observations at Tahiti:” by Captain Edward Belcher, R.N. Communicated by Captain Beaufort, R.N., F.R.S., &c.

This paper consists of copies of the Tide Journal, registered at the Island of Motuatu, in the Harbour of Papeete, and of a short comparative series made at Point Venus. They were conducted by Mr. McKinley Richardson, Mate. The construction of the tide-gauge is described; and an account is given of the methods of observation, and of the precautions adopted to ensure accuracy. The results are specified in the following letter from the author to Captain Beaufort, which accompanies the paper:—

“Her Majesty’s Ship Sulphur, Woolwich, August 2, 1842.

“SIR,—Referring to the Tide Registries, forwarded on my arrival, I beg leave to offer the following general remarks upon the tides at Tahiti.

“In consequence of your very special instructions relative to the determination of the *actual periods* of high water at the Island of Tahiti, the most minute attention was paid to this subject; and as these periods could only be *approximated*, recourse was had to my old method (successfully practised in the Lancashire survey), of deriving them from the Equal-altitude system.

“By a reference to the Tide Registry annexed, it will be found that there are *two distinct periods of high water*, during each interval of twenty-four hours; and that during the seven days preceding, and seven days following the full and change, they are confined between the limits of 10 A.M. and 2^h 30^m P.M., the whole range of interval, by day as well as by night, being about 4^h 27^m.

“Commencing with the seventh day preceding the full moon, viz. the 9th of April, it will be perceived that high water occurs at 10 A.M., this being the greatest A.M. interval from noon; and that on the 16th, at the full moon, it occurs nearly at noon.

“Passing on to the 23rd, it reaches the greatest P.M. limit at 2^h 30^m, and on the 2nd of May again reaches the noon period.

“Between the 23rd and 24th, however, a sudden anomaly presents itself. Throughout the day of the 23rd, the variation of the level does not exceed 2½ inches, and the general motion is observed to be ‘irregular.’ The time of high water is also the extreme P.M. limit.